CLAIMS:

1. A separating material producable by:

a) providing a solid substrate, having amino-functional groups coupled to the substrate surface,

b) covalently coupling of the amino-functional groups with a thermally labile radical initiator,

c) contacting the substrate surface with a solution of polymerizable monomers under conditions, where thermally initiated graft copolymerization of the monomers takes place, to form a structure of adjacent functional polymer chains on the surface of the substrate.

2. The separating material of claim 1, wherein the solid substrate is a porous polymeric material, preferably a porous polymeric material having a pore size that is sufficiently large to allow passage of blood, blood plasma, or blood serum through the substrate material.

3. The separating material of any of claims 1 or 2, wherein the solid substrate is in the form of a membrane, a hollow fibre membrane, a particle bed, a fibre mat, or beads, preferably a hollow fibre membrane.

4. The separating material of any of claims 1 to 3, wherein the solid substrate is made of a biocompatible material.

5. The separating material of any of claims 1 to 4, wherein the solid substrate is made of a material selected from the group, consisting of polyacrylates, polystyrene, polyethylene oxide, cellulose, cellulose derivatives, polyethersulfone (PES), polypropylene (PP), polysulfone (PSU), polymethylmethacrylate (PMMA), polycarbonate (PC), polyacrylonitrile (PAN), polyamide (PA), polytetrafluorethylene (PTFE), cellulose acetate (CA), regenerated cellulose, and blends or copolymers of the foregoing, or blends or copolymers with hydrophilizing polymers, preferably with polyvinylpyrollidone (PVP) or polyethyleneoxide (PEO).

6. The separating material of any of claims 1 to 5, wherein the amino-functional groups are primary amino groups.

7. The separating material of any of claims 1 to 6, wherein the thermally labile radical initiator, as the starting material before coupling to the amine groups on the substrate, comprises at least one, preferably two carboxylic groups.

8. The separating material of any of claims 1 to 7, wherein the thermally labile radical initiator includes compounds which decompose to give free radicals on thermal activation, preferably the thermally labile radical initiator being selected among azo compounds or peroxides.

9. The separating material of any of claims 1 to 8, wherein the thermally labile radical initiator is 4,4'-azobis-(4-cyanovaleric acid) or 2,2'-azobis-[N-(2-carboxyethyl)-2-methylpropionamidine.

10. The separating material of any of claims 1 to 9, wherein the polymerizable monomers are selected from compounds having a polymerizable double bond.

11. The separating material of any of claims 1 to 10, wherein the polymerizable monomers are selected from the group, consisting of

acrylic acid, methacrylic acid, vinyl compounds, and derivatives of the foregoing compounds,

N,N-Dimethylaminoethyl acrylamide, N,N-Diethylaminoethyl acrylamide, N,N-Dimethylaminopropyl acrylamide (DMPA), N,N-Dimethylaminopropyl methacrylamide, N,N-Dimethylaminoethyl methacrylate, N,N-Diethylaminoethyl methacrylate, N,N-Dimethylaminoethyl acrylate, N-Morpholinoethyl acrylate, N-Morpholinoethyl methacrylate, 1-Vinylimidazole, Trimethylammoniumethyl acrylamide, Trimethylammoniumpropyl methacrylamide, Trimethylammoniumethyl methacrylate,

Glycidyl acrylate, Glycidyl methacrylate, Vinyl glycidyl ether, Vinyl glycidyl urethane,

2-Hydroxyethyl methacrylate, 2-Hydroxypropyl methacrylate, Hydroxymethyl methacrylate, N-Vinylpyrrolidone, 2-Vinyl pyridine, 4-Vinyl pyridine, N-Vinyl-2-methylimidazole.

12. The separating material of any of claims 1 to 11, wherein the polymerizable monomers comprise Dimethylaminopropyl acrylamide (DMPA).

13. The separating material of any of claims 1 to 12, wherein the polymerizable monomers are selected from compounds of the following formula:

$H_2C=C(R^1)-C(O)-X-R^2-N(R^3)_2$,

wherein R^1= hydrogen, methyl or ethyl group; R^2= C1-C6-alkyl or aryl group; R^3= methyl or ethyl group; and X= NH or O.

14. A method for the production of a separating material by:

a) providing a solid substrate, having amino-functional groups coupled to the substrate surface,

b) covalently coupling of the amino-functional groups with a thermally labile radical initiator,

c) contacting the substrate surface with a solution of polymerizable monomers under conditions, where thermally initiated graft copolymerization of the monomers takes place, to form a structure of adjacent functional polymer chains on the surface of the substrate.

15. The method of claim 14, wherein the solid substrate is a porous polymeric material, preferably a porous polymeric material having a pore size that is sufficiently large to allow passage of blood, blood plasma, or blood serum through the substrate material.

16. The method of any of claims 14 and 15, wherein the solid substrate is in the form of a membrane, a hollow fibre membrane, a particle bed, a fibre mat, or beads, preferably a hollow fibre membrane.

17. The method of any of claims 14 to 16, wherein the solid substrate is made of a biocompatible material.

18 The method of any of claims 14 to 17, wherein the solid substrate is made of a material selected from the group, consisting of polyacrylates, polystyrene, polyethylene oxide, cellulose, cellulose derivatives, polyethersulfone (PES), polypropylene (PP), polysulfone (PSU), polymethylmethacrylate (PMMA), polycarbonate (PC), polyacrylonitrile (PAN), polyamide (PA), polytetrafluorethylene (PTFE), cellulose acetate (CA), regenerated cellulose, and blends or copolymers of the foregoing, or blends or copolymers with hydro-

philizing polymers, preferably with polyvinylpyrollidone (PVP) or polyethyleneoxide (PEO).

19. The method of any of claims 14 to 18, wherein the amino-functional groups are primary amino groups.

20. The method of any of claims 14 to 19, wherein the thermally labile radical initiator, as the starting material before coupling to the amine groups on the substrate, comprises at least one, preferably two carboxylic groups.

21. The method of any of claims 14 to 20, wherein the thermally labile radical initiator includes compounds which decompose to give free radicals on thermal activation, preferably the thermally labile radical initiator being selected among azo compounds or peroxides.

22. The method of any of claims 14 to 21, wherein the thermally labile radical initiator is 4,4'-azobis-(4-cyanovaleric acid) or 2,2'-azobis-[N-(2-carboxyethyl)-2-methylpropionamide.

23. The method of any of claims 14 to 22, wherein the polymerizable monomers are selected from compounds having a polymerizable double bond.

24. The method of any of claims 14 to 23, wherein the polymerizable monomers are selected from the group, consisting of

acrylic acid, methacrylic acid, vinyl compounds, and derivatives of the foregoing compounds,

N,N-Dimethylaminoethyl acrylamide, N,N-Diethylaminoethyl acrylamide, N,N-Dimethylaminopropyl acrylamide (DMPA), N,N-Dimethylaminopropyl methacrylamide, N,N-Dimethylaminoethyl methacrylate, N,N-Diethylaminoethyl methacrylate, N,N-Dimethylaminoethyl acrylate, N-Morpholinoethyl acrylate, N-Morpholinoethyl methacrylate, 1-Vinylimidazole, Trimethylammoniumethyl acrylamide, Trimethylammoniumpropyl methacrylamide, Trimethylammoniumethyl methacrylate,

Glycidyl acrylate, Glycidyl methacrylate, Vinyl glycidyl ether, Vinyl glycidyl urethane,

2-Hydroxyethyl methacrylate, 2-Hydroxypropyl methacrylate, Hydroxymethyl methacrylate, N-Vinylpyrrolidone, 2-Vinyl pyridine, 4-Vinyl pyridine, N-Vinyl-2-methylimidazole.

25. The method of any of claims 14 to 24, wherein the polymerizable monomers comprise Dimethylaminopropyl acrylamide (DMPA).

26. The method of any of claims 14 to 25, wherein the polymerizable monomers are selected from compounds of the following formula:

$H_2C=C(R^1)-C(O)-X-R^2-N(R^3)_2$,

wherein R^1= hydrogen, methyl or ethyl group; R^2= alkyl or aryl group; R^3= methyl or ethyl group; and X= NH or O.

27. Use of a separating material of any of claims 1 to 13 for the extracorporeal treatment of blood, blood plasma or blood serum.

28. The use of claim 27 for the extracorporeal removal of endotoxins from blood, plasma or serum of septic patients.

29. Use of a separating material of any of claims 1 to 13 for affinity adsorption, ion-exchange adsorption, hydrophobic adsorption, hydrophilic adsorption, or affinity adsorption applications.

30. A separating column comprising the separating material of any of claims 1 to 13, whereby the separating material is in the form of beads, the beads being packed into the column, and the beads having a size sufficient to provide a porosity allowing passage of blood cells through the column.

31. A separating cartridge, comprising a tube, multiple hollow fibre membranes potted into the tube, the tube being fitted with ports, and the membranes having a pore size sufficient to allow passage of blood plasma through the membrane, wherein the membrane is made of the separating material of any of claims 1 to 13.